Oct. 11, 1960 G. N. HEIN, JR 2,955,468

THERMOMETER SHAKER

Filed Jan. 24, 1957

Fig. 1

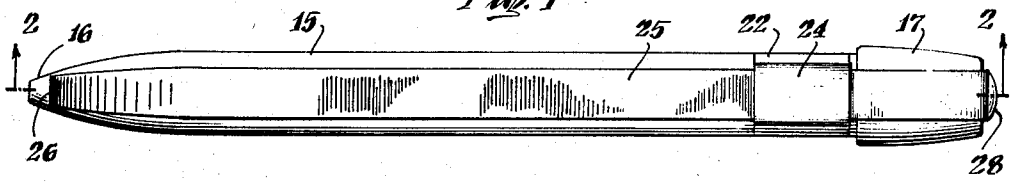


Fig. 2

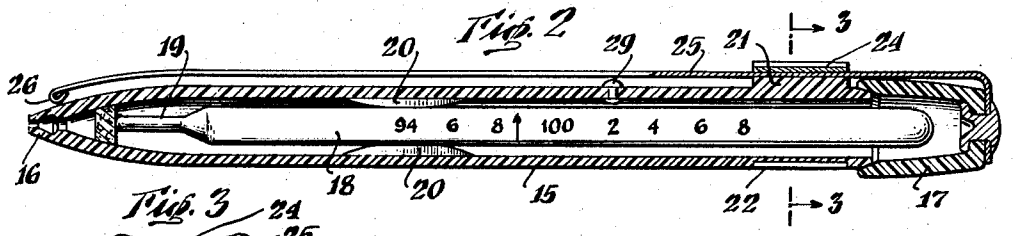


Fig. 3

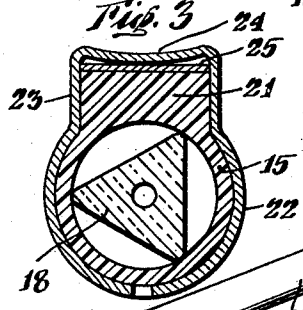


Fig. 4

Fig. 7

Fig. 5

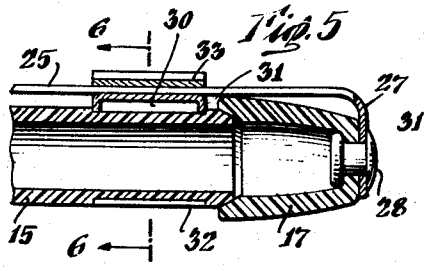


Fig. 6

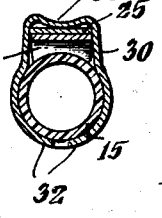


Fig. 8

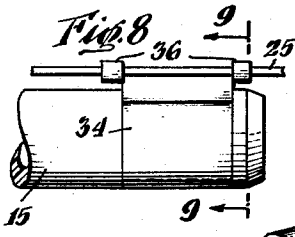


Fig. 9

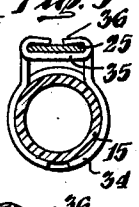


Fig. 11

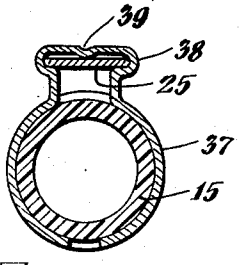


Fig. 10

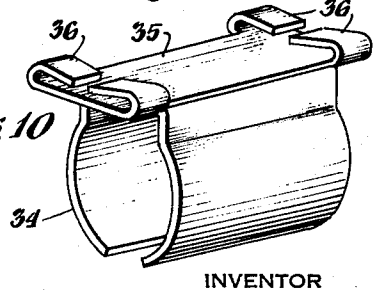
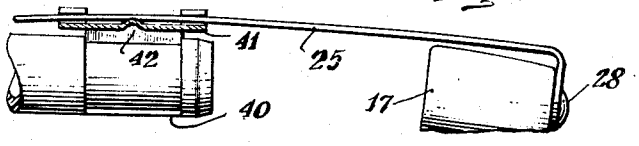


Fig. 12



INVENTOR

George N. Hein, Jr.

BY

Kane, Dalsimer and Kane

ATTORNEYS

United States Patent Office 2,955,468 Patented Oct. 11, 1960

2,955,468

THERMOMETER SHAKER

George N. Hein, Jr., San Carlos, Calif., assignor to Becton, Dickinson and Company, Rutherford, N.J., a corporation of New Jersey

Filed Jan. 24, 1957, Ser. No. 636,144

5 Claims. (Cl. 73—373)

This invention relates to a structurally and functionally shaking device for use in connection with thermometers of the clinical type.

By means of the present teachings, a unit is furnished which may readily be employed by an unskilled person to assure a rapid return of the registering medium (such as a mercury column) of a clinical thermometer to an initial position. Accordingly it will not be necessary to resort to the usual technique of violently shaking a thermometer to assure a return of its registering medium to the desired position.

A further object is that of furnishing a structure which will be compact and of simple design. The parts thereof will be susceptible to economical manufacture, and furnish an assembly adequately housing and supporting a thermometer to protect the same, and in which those parts may be readily extended with respect to each other to achieve the desired shaking operation.

With these and other objects in mind reference is had to the attached sheet of drawing illustrating practical embodiments of the invention, and in which:

Fig. 1 is a side elevation of the shaking device with the thermometer in housed position;

Fig. 2 is a longitudinal sectional view taken along the line 2—2 in the direction of the arrows as indicated in Fig. 1;

Fig. 3 is a transverse sectional view in enlarged scale taken along the line 3—3 in the direction of the arrows as indicated in Fig. 2;

Fig. 4 is a side elevation of the parts, separated a maximum distance;

Fig. 5 is an enlarged fragmentary sectional view of a structure alternative to that shown in the preceding views;

Fig. 6 is a transverse sectional view taken along the line 6—6 in the direction of the arrows as indicated in Fig. 5;

Fig. 7 is a fragmentary plan view of a unit;

Fig. 8 is a fragmentary elevational view of a portion of the housing, and showing the clip structure of Fig. 7;

Fig. 9 is a transverse sectional view taken along the line 9—9 as indicated in Fig. 8;

Fig. 10 is a perspective view of the clip of Figs. 8 and 9;

Fig. 11 is a view similar to Figs. 3, 6 and 9, showing a still further form of structure; and

Fig. 12 is a fragmentary side view of a preferred design of clip and spring.

Referring primarily to Figs. 1 to 3, the numeral 15 indicates a casing having a substantially closed end 16. A cap 17 may close its other end and also serve as a support. Conveniently, these parts are manufactured of hard rubber, plastic or other similar material. Through the open end and into the bore of housing 15 the stem 18 of a clinical thermometer may be inserted with its bulb end 19 inwardly. So disposed, it conveniently engages with inwardly extending ribs or fins 20 which frictionally bear against it. The length of the thermometer—as shown—should preferably be such that with its bulb end in fully projected position, its outer end will extend beyond the open housing, so that it may be gripped by the fingers of the user and withdrawn from the latter.

According to the structure shown in Figs. 1 to 4 inclusive, housing 15 includes an integral boss portion 21 disposed adjacent the open end of the housing. That boss defines the zone adjacent which a clip furnishing a guiding structure is disposed. The clip conveniently includes arm portions 22 each of arcuate shape and embracing the annular faces of the housing 15. These arms are continued in the form of parts 23 disposed in parallel relationship and in intimate contact with the outer faces of boss 21. The arms are connected by a bridging portion 24 which is preferably inwardly bowed to extend towards the outer face of boss 21. The clip serves as a guide in that a strip 25 is interposed between its base 24 and the adjacent outer face of the boss, and is urged by the former portion into frictional engagement with that face. This strip is preferably provided by flat spring stock, and its length is such that it extends from a point adjacent the end 16 of housing 14 to a point adjacent the outer surface of the mounting furnished by cap 17.

At its formed or free end, strip 25 conveniently terminates in a bead 26 or rolled over portion. To furnish a stop the area of the latter is such that it will not pass through the guiding structure furnished by the base 24 of the clip, and the adjacent surface of the boss. Its opposite end, conveniently extends perpendicular to the axis of the assembly as indicated at 27. That end is formed with an opening through which the body of a rivet 28 may project to permanently, and immovably secure the strip against detachment from that cap. While in the succeeding views, the same general attaching structure has been illustrated, it will be appreciated that various alternatives may be resorted to, to prevent movement between the support furnished by cap member 17 and strip 25. As will also be noted, a rivet 29 may conveniently be furnished to have its head extending beyond the outer surface of housing 15, at a point underlying strip 25, and adjacent boss 21.

As in Figs. 5 and 6, boss 21 may be eliminated. In lieu thereof, a bolster plate 30 provided with inwardly extending end portions 31 may be utilized. Those end portions present arcuate edges bearing against the outer surface of the housing. This plate is retained in position by preferably employing a clip structure embracing arms 32 similar to arms 22 in direct contact with the outer face of the housing, and extending thence parallel to the outer edges of end portions 31 to terminate in a base 33. This is inwardly extended to furnish adequate engagement with a strip 25, so that the latter is frictionally gripped.

Various other alternative structures will be apparent from a consideration of Figs. 7, 8, 9, 10 and 11. In the first four of these views, a pair of plates 34 are furnished which are transversely curved in opposed relationship to intimately engage and embrace the housing 15. These plates are joined by base portion 35. At points beyond the plates, the latter is furnished with clips 36. Those clips receive and retain in slidable association a strip 25. In Fig. 11, plates 37 corresponding to plates 34 are present. However in lieu of a base portion 35, an inwardly indented and channeled part 38—39 is provided to receive and frictionally engage with strip 25.

In all of the foregoing forms, it is apparent that with the parts disposed in the positions shown in Figs. 1 and 2, a thermometer will be adequately housed. Under those circumstances, the free end of strip 25 will project beyond the guide structure furnished by the clip to provide a retaining member engaging the outer surface of

the pocket when a user disposes the housing within that pocket. In this connection, the head of the rivet **29** or equivalent element will likewise assist to retain the parts. When it is desired to use the thermometer, this may readily be done by simply projecting the mounting member or supporting element provided by cap **17** to the full extent allowed by spring strip **25**. Thereupon, the thermometer stem **18** may readily be withdrawn from the housing, and the thermometer used in accordance with conventional technique.

When it is desired to "shake down" the thermometer, all that is necessary for the user to do is to reinsert the bulb end **19** of the thermometer through the open end of the housing to the position shown in, for example, Fig. 2. Under vibration of the thermometer, the support furnished by cap **17** is gripped between the fingers as shown in Fig. 4. Now, by swinging housing **15** in the direction of the flexion characteristic of spring **25**, the device will vibrate rapidly like a pendulum. That vibration might be likened to a straight whipping action and due to the flat characteristic of strip **25**, will occur through an arc in a single plane.

In Fig. 12 a somewhat diagrammatic illustration of the clip, cap and strip structure has been resorted to. In that view, the numeral **40** designates a barrel-encircling or engaging portion which serves to retain the assembly in operative association with that barrel as in the earlier figures. Conveniently the outer end of the strip of spring steel **25** is angularly offset and secured by a rivet **28** to the cap **17**. The encircling or mounting portions **40** are continued in the form of tabs **41** overlying and slidably engaging the upper surface of strip **25**. Conveniently, the retaining structure **40** at points intermediate these tabs is indented as at **42** to provide a detent. Under these circumstances, strip **25** is placed under a condition of tension so that it is bowed. With this flexing of the spring strip, the latter utilizes its own tension, and inherent resiliency for frictional engagement with the tab structures **41** of the clip. By so utilizing the flexing of the spring strip through its longest axis, lasting frictional contact is assured, and a structure furnished which will have a very long life. Also, the spring strip will be restrained against accidental movement longitudinally of the barrel.

It will be found, under vibration of the thermometer that the mercury or other registering medium of the thermometer will almost immediately return to its initial position. That position, of course, is adjacent the bulb end **19** of the stem. This will be true, despite the fact that frequently only a single initial flexion or whip of the spring strip **25** has been resorted to after which the spring strip is allowed to vibrate the housing. Where necessary, this operation may be repeated. With the registering medium returned to its desired initial position, the cap **17** or equivalent element providing the support is mounted adjacent the open end of the housing. Under those circumstances, spring strip **25** will be projected as shown in Figs. 1 and 2 to lie immediately adjacent the outer face of the housing, and substantially parallel to the axis of the same. So disposed, it will retain cap **17**

against accidental detachment from the housing. The device may now again be reapplied to the material of the user's pocket if desired.

Thus among others, the several objects of the invention as specifically aforenoted are achieved. Obviously numerous changes in construction and rearrangement of the parts may be resorted to without departing from the spirit of the invention as defined by the claims.

I claim:

1. A thermometer shaker, including in combination a housing having an open end through which the bulb and stem of a thermometer are insertable to retain the same, a support to be gripped between the fingers and to normally lie adjacent the open end of said housing, and a substantially flat spring connected to said housing to be slidable axially thereof, means limiting such sliding movement and said spring having an outer end fixedly connected to said support to limit the amount the latter may be spaced from the open end of said housing; the length of said spring being substantially equal to the length of said housing to support the latter for vibratory movement.

2. In a thermometer shaker as defined in claim 1, the connection between said spring and housing including a guide affixed to the latter and said guide slidably embracing said spring.

3. A thermometer shaker assembly including in combination a housing having one open end and presenting a bore to receive and retain a clinical thermometer, a cap closing the end of said housing, a spring strip having a length substantially equal to that of the housing and fixedly connected at one of its ends to said cap, a guide mounted by said housing at a point adjacent its open end, said strip being supported by said guide solely for sliding movements parallel to the housing axis, and means adjacent the opposite end of said strip and engageable with said guide to limit axial movements of said strip and cap with respect to said housing to a point where said strip extends beyond the open end of said housing and supports the latter for vibratory movements.

4. In a thermometer shaker as defined in claim 3, means forming a part of said assembly and providing for frictional engagement of relatively movable parts thereof to retard axial movements of said strip with respect to said housing.

5. In a thermometer shaker as defined in claim 2, means forming a part of said guide to place the spring under a condition of tension and flex the same, and said spring thereby frictionally engaging with portions of said guide.

References Cited in the file of this patent

UNITED STATES PATENTS

837,339	Peterson	Dec. 4, 1906
2,547,353	Wiinikka	Apr. 3, 1951
2,753,716	Futterman	July 10, 1956

FOREIGN PATENTS

712 of 1911	Great Britain	Aug. 24, 1911